ONLINE BANKING ADOPTION AMONG ACADEMICIANS AT MTUN UNIVERSITIES IN MALAYSIA

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A thesis submitted in fulfilment of the requirement for the award of the Degree of Master of Science in Technology Management

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DEDICATION

Special Dedicated
To my lovely mother amazing father, I couldn’t have done this without you. I believe that this achievement will complete your dream that you had for me all these many years ago when you chose to give me the best education you could.
ACKNOWLEDGEMENT

In the name of ALLAH, the Most Beneficent, the Most Merciful. All praise goes to almighty ALLAH who is the Lord of worlds. The compassionate, The Merciful.
I am grateful and would like to express my sincere gratitude to my supervisor, Dr. Shafie Bin Mohamed Zabri for his tireless efforts, encouragement, guidance and unconditional support throughout this research. I appreciate my siblings for their affection; I couldn’t imagine my life without them.
ABSTRACT

The advancement of technology especially the invention of the internet has changed the way organizations conduct their businesses today including banks especially in offering online banking services. Online banking services had been introduced in Malaysia in the year 2000. However, bank customers including academicians in Malaysia are influenced by issues of trust of online banking which also affects their level of adoption. In addition, there were only few studies which have combined Technology Acceptance Model (TAM) and Perceived Risk Theory (PRT) in understanding the adoption of online banking services in Malaysia. Therefore, this study intended to determine the factors influencing the adoption of online banking based on TAM (Perceived Usefulness, PU; Perceived Ease of Use, PEOU) as the base model, with Government Support (GS) being included as the additional variable. Furthermore, based on PRT, Trust is also included in this study. Variables influencing Trust (Perceived Security, PS; Perceived Risk, PR; Perceived Privacy, PP) are also assessed as well as the moderating influence of Trust on the relationship between PU, PEOU and GS, with the adoption of online banking in Malaysia. Respondents of this study were selected among academicians at Malaysian Technical Universities Network (MTUN) based on simple random sampling approach. Data was collected through the use of survey questionnaires. A total of 600 questionnaires were distributed while 253 of them were retrieved and usable for data analysis. Data analysis was carried out with the aid of the Statistical Package for Social Sciences (SPSS). The main results of this study revealed that PU and PEOU have significant influence on the adoption of online banking while GS was found not to be significant. Besides, PS and PR were also found to be significant in influencing Trust, while PP was found to be non-significant. Finally, Trust is also found to have a moderating influence on the relationship between PU and GS with the adoption of online banking and not significant in moderating the relationship between PEOU with the adoption of online banking. These findings sheds some valuable information to be considered by banks in offering online banking services to their customers as well as additional new practical and informational understanding to current literature on the adoption of online banking services.
ABSTRACT

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<td>Online Banking Adoption</td>
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<td>TAM</td>
<td>Technology Acceptance Model</td>
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<td>PRT</td>
<td>Perceived Risk Theory</td>
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<td>PU</td>
<td>Perceived Usefulness</td>
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<td>PEOU</td>
<td>Perceived Ease of Use</td>
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<td>GS</td>
<td>Government Support</td>
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<td>PS</td>
<td>Perceived Security</td>
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<td>PP</td>
<td>Perceived Privacy</td>
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<td>PR</td>
<td>Perceived Risk</td>
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<td>USA</td>
<td>United States of America</td>
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<td>UK</td>
<td>United Kingdom</td>
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<td>MUTN</td>
<td>Malaysian Technical University Network</td>
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<td>UTHM</td>
<td>University Tun Hussein Onn Malaysia</td>
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<tr>
<td>UTEM</td>
<td>University Technical of Malaysia Malacca</td>
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<tr>
<td>UNIMAP</td>
<td>University Malaysia Perlis</td>
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<tr>
<td>UMP</td>
<td>University Malaysia Pahang</td>
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<tr>
<td>IIUM</td>
<td>International Islamic University Malaysia</td>
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<td>IT</td>
<td>Information Technology</td>
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CHAPTER 1

INTRODUCTION

1.0 Introduction

The advancement of technology especially the invention of the internet has changed the way of organizations conduct their business today. Market globalization, advancement in technology and intense competition between banking institutions have forced banks to find new market and innovative financial services (Laukkanen, 2007). Online banking services are gaining popularity around the world. Shih & Fang (2004) describes online banking, as a new information system that uses the internet and innovative resources of the World Wide Web (www) to enable customers to perform financial activities in virtual spaces. Online banking offers many benefits to banking institutions and customers. According to Jayawardhena & Foley (2000), the main benefits it offers to banks are cost savings, efficiency of the new population groups, improved reputation of the bank, and benefits to customers including balance inquiries, bill payments, and transfers of funds and access to virtually any type of banking transaction at the click of the mouse available 24 hours of the day. Besides, it can save time, reduce effort, enjoyable, useful and convenient (Laukkanen, 2007). Muzvidzi et al. (2013) reported that online banking charges are much less compared to traditional banking. For instance, the availability of online banking services provide avenue for the customers to choose a wide range of banking services virtually anytime and anywhere (Tanet et al., 2010). Booz Allen & Hamilton (2001), claiming that the average payment transaction fee through the internet was $0.01, compared with $0.02 for personal computer banking services, $0.027 for ATM services, $0.54 for telephone banking and $1.07 for transactions carried out in bank branches in UK. From a customer's point of view, this banking channel facilitates a
convenient and efficient way to manage the needs of individual banks as it can be accessed from any location 24 hours a day, 365 days a year without having to visit a bank branch.

Similarly, online banking is still considered low in Malaysia compared to European countries, and some bank customers are increasingly interested. Most importantly, it will be useful for users who are willing to adopt the technology. The focus of this study is online banking, which is considered to be the most important and popular channel for providing banking services in the internet age.

1.1 Background of Study

Online banking is defined as a remote delivery channel that uses the internet as a banking system service over the World Wide Web (www), which allows customers to access their financial information directly and conduct financial transactions without going to the bank. Xue et al. (2011) stressed that most banks have deployed online banking systems to reduce costs while improving customer service.

The Malaysian Central Bank officially approved online banking services in Malaysia on June 1, 2000, with the Malaysian Bank Berhad (Maybank), being the first bank to provide customers with the vision of online banking. The online banking portals provide services such as bill payments, balance enquiries, credit card payments, funds transfers, account summaries, and transaction history.

Online banking has become a central research area for many researchers in Malaysia. Specifically, recent research conducted in online banking was conducted by (Khalil et al., 2010; Fahim et al., 2012 and San Ong et al., 2014), the study reported online banking research in Malaysia is still at infancy. According to Al-Fahim et al. (2012), students at the International Islamic University Malaysia (IIUM) are not compliant with e-banking due to ineffective marketing awareness by the banking officials to the students.

According to, Bashir et al. (2015), theories/models extended to explain technology adoptions including, Innovation Diffusion Theory (IDT; Rogers, 1983), Technology Acceptance Model (TAM; Davis, 1989), Decomposed Theory of Planned Behaviour (DTPB; Taylor and Todd, 1995), Extended Technology Adoption Model (TAM2; Venkatesh and Davis, 2000) and Unified Theory of Acceptance and Use of
Technology (UTAUT; Venkatesh et al., 2003). These theoretical approaches have contributed significantly to providing important guidance to banking institutions to enhance the adoption of online banking services. The acceptance of online banking services has become a key issue in today's business world. Although the adoption of online banking services has been widely adopted in developed countries, the adoption of online banking services by customers in developing countries is slower than expected (AbuShanab et al., 2010 and Nasri & Charfeddine, 2012). On the other hand, in Malaysia, academicians and other general public will be affected if their accounts are hacked. Therefore, it becomes important and necessary to determine the adoption of online banking adoption among academicians in Malaysian Technical University Network (MTUN).

1.2 Problem Statement

Online banking constitutes a fusion of conventional banking and web technology. It has been increasingly offered by banking sectors worldwide. The introduction of information technology facilities such as online banking has resulted in improved service quality and excellent service provision in the banking industry (Sahut et al., 2015). Online banking has been implemented in developed countries such as the United States, Australia, Estonia and other countries in Europe, and the adoption trend of online banking in developing countries has also increased (George et al., 2014). While online banking has been introduced in Malaysia since 2000, there are still some Malaysians who do not have a good exposure of the benefits of using online banking services, mainly due to trust issues. San Ong et al. (2014) reported that online banking adoption has been initiated in Malaysia but there is still a whole lot of Malaysian preferring to use traditional banking. As a result, Malaysia's acceptance of online banking is low.

In addition, these studies focus on online banking in Malaysia and they have reported that online banking research is still at infancy due to lack of awareness of the service and the benefits they offer to users as well as how they can be used (Al-Fahim et al., 2012; Munusamy et al., 2012; San Ong et al., 2014 and Yen et al., 2016). Acceptance of online banking in Malaysia remains relatively low, only 31% of Malaysians have interest in online banking; 73% are worried about security issues
and concerns as well as privacy issues (San Ong et al., 2014). However, since the beginning of 2011, the number of online banking users had increased to 11.6 million which represents 41% of the population. In 2012, the number of Malaysian online banking subscribers was 13.4 million and had increased to about 46% and in 2013, the number of Malaysian online banking subscribers had increased to 14.8 million which represents 50% of the Malaysian population. This indicates that half of the Malaysian population had adopted the idea of online banking (Jalil et al., 2014). Despite the increased usage of online banking services in Malaysia, security issues still remain a great threat due to increase in activities of scammers. Scamming activities had drastically risen as the number of reports made to cyber security authorities increased from 634 in 2009 to 1,426 reports in 2011 (Levi, M. 2016).

These scamming activities are being perpetrated by fraudsters. Fraudsters carry out attacks on users by compromising the user’s security details which is the user’s password. Once the user’s account is compromised there stands nothing between the user’s funds and the fraudster. This results not only in the user’s loss of funds, but also violates the user's privacy. This has resulted in many internet users not utilizing online banking services due to concerns of distrust and fear of being hacked. Owolabi (2010) pointed out that the problem of frauds associated with banking institutions are not limited to a particular geographical location, economy, country, or environment; but are issues which are experienced by users all over the globe. Therefore, lack of trust or inadequate skills to use online banking services are the reasons that prevent customers from utilizing online banking. According to Mangin et al. (2014), fostering trust will help customers develop confidence in conducting financial transactions over the internet, rather than conducting the same transaction in the bank office.

To successfully incorporate technology into a system, users have to accept and adopt the technology and this can be achieved by instilling high level of trust among users. Safeena et al. (2010) and Dash et al. (2012) found that perceived risk was the primary inhibition of customer trust towards utilizing online banking services. Very few studies have combined and applied Technology Acceptance Model (TAM) with constructs of Perceived Risk Theory (PRT) in the field of online banking services (Castañeda et al., 2007; Celik, 2008 and Bashir et al., 2015). A study by Kesharwani & Bisht (2012) who applied extended TAM found that
perceived usefulness (PU), perceived ease of use (PEOU), perceived risk and social influence have significant and positive impact on the behavioral intentions of customers using online banking services. Varaprasad et al. (2013) extended TAM by adding relative advantage, perceived risk and conspicuous constructs and found that perceived usefulness (PU), perceived ease of use (PEOU), perceived risk, relative advantage and conspicuous are the important determinants of online banking adoption. In a more recent study, Sharma & Srikrishna (2014) added social influence, quality of online connection, awareness and self-efficacy constructs into their model.

Despite substantial studies in this area, there are little studies that combined and applied Technology Acceptance Model (TAM) with Perceived Risk Theory (PRT) in the field of online banking services. Therefore, this study is intended to determine the factors influencing online banking adoption among academicians at MTUN universities in Malaysia by adapting extended Technology Acceptance Model (TAM) combined with the Perceived Risk Theory (PRT). We take academicians in this research because no research on this two models takes academicians into considerations (Tan et al., 2016) and also almost all academicians are into banking activities either by receiving salaries or doing other activities.

1.3 Research Questions

1. What is the level of online banking adoption among academicians at MTUN universities in Malaysia?

2. What are the factors influencing the online banking adoption among academicians at MTUN universities in Malaysia?

3. What are factors influencing the level of trust on online banking adoption among Academicians at MUTN universities in Malaysia?

4. Does trust moderate the relationship between the factors that influences online banking adoption and academician’s online banking adoption?
1.4 Research Objectives

Based on the problem statement discussed, the objectives of this study are as follows:

1. To investigate the level of online banking adoption among academicians at MTUN universities in Malaysia.

2. To determine the factors influencing online banking adoption among academicians at MTUN universities in Malaysia.

3. To assess the factors influencing the level of trust on online banking adoption among academicians at MTUN universities in Malaysia.

4. To determine the relationship between the factors that influences online banking adoption and academician’s online banking adoption with trust as a moderating variable.

1.5 Research Scope

Online banking is one of the most important parts of the banking system. Wan et al. (2005) reported that online banking has been used as a conduit for distribution of banking services and products among customers. Sohail et al. (2003) added that the success of online banking adoption also depends on customer acceptance. In addition, the increase in internet users should lead to an increase in online banking users also.

This study was based on the TAM and PRT as a theoretical framework to investigate the level of online banking adoption among Academicians at MTUN universities in Malaysia. This study is a cross sectional quantitative study to obtain data concerning the usage of online banking by intended users. This study utilizes a survey as data collection. Data were collected from academicians at Malaysian Technical University Network (MTUN) which bring together four technology based universities in Malaysia (the University Malaysia Perlis (UNIMAP), Technical University of Malaysia Malacca (UTEM), the University of Tun Hussein Onn Malaysia (UTHM) and University of Malaysia Pahang (UMP).The target population based on each university website 2016, UNIMAP = 734, UTEM = 983, UTHM =
1029 and UMP = 720. The total population of academicians is 3466. The sample size was determined based on Krejcie and Morgan table (Krejcie& Morgan, 1970), sample size of this study was 346. The respondents were selected through simple random sampling from different faculties, races and academic level.

1.6 Significance of the Study

Online banking has the potential to improve customer satisfaction and bank performance (Alsajjan & Dennis, 2010) and at such warrants being studied to bring to limelight its potentialities. As online banking is popular among today’s customers, most companies are using this platform to conduct their business transactions more efficiently. Online banking provides consumers with services such as online bookings, buying products online, transferring funds and paying for utility bills as well as carrying out other transactions. The study would be of utmost significance to banking and financial institutions in Malaysia as well as contribute to the body of literature on online banking adoption. Principally, four contributions are expected from the study; (1) the study would contribute to determining the level of online banking adoption among academicians in MTUN universities in Malaysia (2) the study would contribute to determining the factors that influence online banking adoption among academicians at MTUN universities in Malaysia (3) the study would also contribute to examining the factors that influences the level of trust among academicians at MTUN universities in Malaysia (4) finally the study would contribute to ascertaining the role of trust as a moderator between the factors that influence online banking adoption and its relationship to academician’s online banking adoption.

The study would extend the propositions of online banking theories as two theories have been combine to ascertain the factors that contributes to or influences online banking adoption among academicians. Technology Acceptance Model (TAM) and Perceived Risk Theory (PRT) have been applied in the new context of the online banking adoption and would hopefully extend the theories of TAM as it relates to online banking acceptance.

As stated earlier this study would be significant to banking institutions and customers. Banking institutions can utilize the results emanating from this study to
The study can be used in the bank improvement system to facilitate user experiences for customers who utilize online banking services by improving user access to customers anytime, anywhere and more efficient services. Since the factors that influence online banking adoption would be explored from this study, banking institutions can save use this results to facilitate more customer adoption of online banking services by exploring how they mitigate or contribute to these factors.

In addition, the study may be an incentive for banks to organize meetings and educate users about the flexibility and accessibility that comes with online banking adoption. This will help strengthen user's trust in banking services and online banking channels. In addition, banks can increase customer’s awareness of the risk associated with online banking services as well as educate them to secure themselves against these security risks thereby instigating trust in customers. Doing this will enable banks provide assurances to their customers that they will be able to maintain a competitive quality of service in the future and avoid losing their customers to their competitors.

Customers on the other hand, can benefit from this study in the following ways. Customers can increase their awareness of the different aspects of risk associated with online banking through the results of this study. As a result, the level of confidence in customers would be increased as a result of being aware of the security threats associated with online banking services and the knowledge of how to protect themselves against these threats. Hence, in the long run, customers would be free to engage in carrying out transactions using online banking services without any form of hesitation.

So far, most internet banking studies have focused on specific countries such as the United States (Dawes & Rowley, 1998; Tuchila, 2000; Pikkarainen et al., 2004; Arnaudovska et al., 2010 and Chau & Ngai, 2009, 2010, and Azouzi 2009). These studies highlight the factors that influence consumer behavior using online banking. However, in Malaysia, previous research on the use of online banking was limited. The researchers found only a few studies on online banking in Malaysia (see Al-Fahim et al., 2012; Munusamy et al., 2012; San Ong et al., 2014 and Yen et al., 2016). Therefore, this study can be viewed as an extension of previous research on online banking adoption.

Despite, the substantial amount of literature on online banking adoption, there is scarce literature explaining how each risk factors affects customer’s trust towards
online banking, this gap has not been adequately addressed in previous studies. Most studies had focused only on one of the risks. For example, (Suki et al., 2015; Yiu et al., 2007 and Sanayei & Noroozi 2009) focused on examining the impact of perceived risk on the adoption of online banking. Other studies have focused on the impact of perceived security on online banking acceptance (Hutchinson & Warren, 2003; Maenpaa et al., 2008). Therefore, in order to fill this gap in the literature, this study identified three types of risk, perceived security, perceived privacy and perceived risk, and investigates how each risk affects the level of trust in online banking adoption, thereby contributing to the body of literature on online banking adoption.

1.7 Conclusion

The focus of the study was on online banking, which is considered to be the most important and popular channel for providing banking services in the internet age. Online banking services in Malaysia was officially provided by the Malaysian Central Bank on June 1, 2000 with the Malayan Banking Berhad (Maybank) providing it amongst its banking services. Since its introduction in Malaysia in the year 2000, there are still a significant amount of Malaysians who do not have good exposure to the advantages of using online banking services, mainly due to trust issues. Since academicians who have much money in their bank's accounts will be the most affected from security threats, if their accounts have are hacked. Thus, this study was designed to investigate the level of online banking adoption among academicians at Malaysian Technical University Network (MTUN) in Malaysia.

In addition, this study combined and adapted the Technology Acceptance Model (TAM) with Perceived Risk theory (PRT) in the field of online banking services, to determine the factors that influence online banking adoption among academicians at MTUN universities in. This study is a cross sectional quantitative study. Data was collected from academicians at Malaysian Technical University Network (MTUN)-which constitutes four technology based universities in Malaysia. These universities include University Malaysia Perlis (UNIMAP), Technical University of Malaysia Malacca (UTEM), University Tun Hussein Onn Malaysia (UTHM) and University Malaysia Pahang (UMP). The respondents were selected
using probability sampling, specifically the simple random sampling technique. Academicians were selected randomly from different faculties, different races and their academic level to participate in the study.

1.8 Organization of the Study

This study was organized in five chapters;

1.8.1 Chapter One

Introduction, consist the back ground of study, problem statement, objectives of study, research questions, research scope and significance of study.

1.8.2 Chapter Two

This chapter presents the literature review, theories used in this study, factors influencing online banking adoption in Malaysia and the factors influencing the level of trust based on previous studies.

1.8.3 Chapter Three

This chapter describes the research frameworks, research design, research instrument, sample and the target population and pilot study. A summary is provided at the end of the chapter.

1.8.4 Chapter Four

This chapter presents the data and analysis based on the research objectives and research questions of the study.
1.8.5 Chapter Five

This chapter presents the summary of findings, conclusions and recommendations of the study.
CHAPTER 2

LITERATURE REVIEW

2.0 Introduction

This section presents the literature review, background of study, advantages, and disadvantages of online banking and definitions of online banking. In addition, online banking in developing countries and developed countries and also discussed, the theories of this study which are Technology Acceptance Model and Perceived Risk Theory are discussed in relation with the objectives of the study. Finally, the factors influencing online banking adoption in Malaysia and the factors influencing the level of trust based on the previous studies are discussed.

2.1 Background

Online banking is an important distribution channel for traditional banking products. Providing reliable and efficient services pose challenges for banks trying to develop their international business (Crede, 1998). With the development of the internet, banks will inevitably provide customers with online banking services. While branch-based retail banks are still the most common method of banking transactions, internet technology has changed the way personal financial services are designed and delivered to customers (Wang et al., 2003). Shih & Fang (2004) describes online banking as a new type of information system that utilizes the internet and the innovative resources of the World Wide Web (www) to enable customers to conduct financial activities in virtual space. Through online banking, all regular transactions can be carried out by customers, such as account transfers, bill payments, balance inquiries and stop payment requests (Smith, 2006). According to Smith (2006), with
the help of an online banking system, customers can conduct banking activities at home or at work.

Online banking is a 24/7 service that reduces labor costs, extends service hours, and improves bank efficiency and effectiveness (González et al., 2008 and Smith, 2008). Online banking has been otherwise referred to as PC banking or online banking. With the advent of online banking facilities, customers can perform many transactions such as customer service inquiries, funds transfer from one account to another, loan applications, opening new accounts, and transactions between third-party accounts.

With the rapid changes and developments in information technology (Rahman et al., 2014 and Talukder, 2011, 2010), online banking has introduced new methods and systems that enable banking institutions to serve potential customers. As a result, banks must adapt their forecasting strategies to evolving customer needs and new technological developments. According to Ho & Wu (2009), the cost of online banking in 2000 was about $0.01 per transaction, which means that it accounted for only 1% of all banking transactions. Banks that provide online banking are enabled by introducing products into the online marketplace that attracts customers to use web services. These banks can then use the online performance measurement method to assess their online banking performance.

2.1.1 Definitions of Online Banking

Online banking is the latest delivery channel for retail banking services. Online banking refers to a variety of services through which bank customers can request information and perform most retail banking services, such as balance reports, account transfers, bill payments, without leaving their home or organization, (Mols, 1998 and Sathye, 1999).

Online banking is defined as the use of banking services through computer networks (the internet) (Aladwani, 2001). Online banking is an evolving process and there is no single measure to assess the strength of online banking services (Nielsen & Tahir, 2002). The speed of online banking connections is an important factor for online banking adoption. Online banking is a technological innovation (Lin et al., 2008). Online banking can be defined as a service that allows customers to perform
bank transactions using a computer with an internet connection (Loyd, 2007). In addition, online banking is described by Pearce & Robinson (2000) as a banking transaction type in which people transfer funds, query account balances, pay bills and manage online stock equity. Therefore, online banking is considered a new and innovative way to reach customers and enhance banking products and services. While online banking is still a relatively new phenomenon in developing countries, there is an agreement that the provision of this service will have a considerable impact on the banking sector in these countries (Kesharwani et al., 2012). Online banking is defined in the context of this study as a new service to help customers conduct their banking transactions from anywhere in the world via the internet.

2.1.2 Online Banking in Developed Countries

2.1.2.1 Online Banking in the United States of America (USA)

Online banking has improved the quality of service and superior service delivery in the banking sector (Dawes & Rowley, 1998). Most of the banks with internet presence come from the United States, while in Europe the largest number of bank websites is in the UK, Germany, Spain, Italy and France (Tuchila, 2000). By contrast, in late 2000, about 20% of USA banks provided online banking services, and only 20% of USA private banking customers were using online banking to access online banking services (Sheshunoff, 2000). In general, Europe has been and remains the leader in online banking technology and usage (Schneider, 2001). By the end of 2002, approximately 120 banks in the United States provided online banking services (Pyun et al., 2002). An interesting and striking difference between USA and European banks is that bank of America does not allow a large network of bank branches across the country (Pyun et al., 2002).

Although developed countries such as the United States of America (2004), Kolodinsky (2004), Australia (Sathye, 1999), Estonia (Eriksson et al., 2005) and other countries in Europe (Pikkarainen et al., 2004), Gurau (2002) utilize online banking services. Online banking has also been implemented in many developed countries, such as the United States and Europe (Pikkarainen et al., 2004). A study conducted by Arnaudovska et al. (2010) showed that American students preferred to
shop online rather than shop in stores. Similar studies have examined customer attitudes toward e-banking services in the UK (Chau & Ngai, 2010). Romi et al. (2015) reported that in 2012, 423.5 million internet users had access to online banking websites, 28.7% of the world's internet visitors had access to online banking. Reports showed that 45% visited internet banking sites in North America, 37.8% from Europe, 25.1% from Latin America, 22% from Asia and the Middle East and 8.8% from Africa. In 2013, few research centres reported that 51% of USA adults, or 61% of internet users, accessed online banking, while the percentage in Europe reached 43% (Eurostat 2015). Statistics also show that 45% of European internet users had access to online banking. Factbrowser (2015) shows that 46% of online users who are willing to engage in online banking come from the Asia-Pacific region, 45% from Africa and the Middle East, and 36% from Latin America. In Malaysia, there are only about 14.6 million online banking subscribers, with a total of 14.3 million people as of June 2013 (Jalil et al., 2014).

### 2.1.2.2 Online Banking in the United Kingdom (UK)

The United Kingdom (UK) is one of the most developed countries in Western Europe, providing online banking services. This section focuses more on online banking technology in the UK as an advanced country for banking technology from well established companies. Scott & Walsham (2000) pointed out that the bank of England was the first to introduce a computer-based decision support system in the middle market corporate lending process in the UK retail banking sector.

Despite the steady growth in UK online banking over the past few years, half of UK customers still visit a bank branch each month, suggesting that bank managers need to encourage customers to use the internet daily business to release branch and call center employees for higher value interactions (Forrester, 2009). Azouzi (2009), shows that the younger generation is more willing to adopt online services because it is more comfortable, easy to use, useful, enjoyable, saves time and cost.
2.1.3 Online Banking in Developing Countries

Online banking is common in many developed countries. However, for many developing countries, due to several factors, online banking is still at infancy. As the banking sector is an important part of the service industry, it is important for banks to operate effectively through the use of online banking. The term online banking is associated with online banking or electronic banking, which is appropriately defined to automatically deliver new and traditional banking products to customers via online and interactive communication channels. The rate of globalization and new technological developments has fuelled a new era of e-commerce (Ibrahim et al., 2013), forcing bank centres to adopt toll internet users to grow rapidly in Asia.

2.1.3.1 Online Banking in Malaysia

In Malaysia, the Central Bank of Malaysia formally approved online banking on June 1, 2000. Malaysia's largest bank, (Maybank) was the first bank in Malaysia to offer online banking services. The online banking system makes it easy for financial institutions, customers, individuals and traders to access their accounts, engage in business transactions, and also enable account holders to access information about financial products and services via the intranet (Singhal & Padhmanabhan, 2008). Furthermore, a study by Suganthi & Balachandran, (2001) focused on accessibility, reluctance to change, cost, trust, security issues, convenience, and ease of use as possible factors affecting online banking adoption through online surveys. The results of the study showed that accessibility, unwillingness to change, and awareness were positively associated with online banking adoption.

In Malaysia, the number of online banking frauds had risen enormously with increase in the number of cyber security reports from 634 in 2009 to 1426 in 2011 (Kotze et al., 2014). The scam is carried out against bank customers by providing these customers with a fake but identical website to expose their username and password; this is referred to as phishing in cyber security. Schneier (2000) reveals that phishing attacks occurs on an internet architecture and makes it easy for people in a remote area of the world to mimic legitimate bank websites that expose customers' information, making these customers vulnerable to such attacks. One of
the main reasons customers do not trust internet technology is the uncertainty in the reliability of internet services (Lee & Turban, 2001).

In Malaysia, in early 2011, the number of online banking users increased to 11.6 million, accounting for 41% of the population. In 2012, the number of online banking users in Malaysia increased to 13.4 million representing 46% of the total population. In 2013, the number of online banking users recorded in Malaysia was 14.8 million representing 50.0% of the population, which indicates that half of the Malaysian population used online banking services (Jalil et al., 2014 and Mustafa et al., 2015). Banks in Malaysia appears to have taken such a leap in the number of online banking users as a result of the strategies these banks utilize in creating the needed awareness to acquaint users of online banking services. Information about these services was made readily available through the bank’s website (Nasri et al., 2012). Table 2.1 shows a summary of online banking users in Malaysia from 2005 to 2013. The table corroborates Mustafa et al. (2015) assertions that the number of online users in Malaysia was increasing every year.

Table 2.1: Illustrates the online banking subscribers in Malaysia from 2005 to 2013

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Subscribe ( Millions)</th>
<th>Penetration to Population (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>2.5</td>
<td>9.8</td>
</tr>
<tr>
<td>2006</td>
<td>3.2</td>
<td>12.0</td>
</tr>
<tr>
<td>2007</td>
<td>4.6</td>
<td>16.9</td>
</tr>
<tr>
<td>2008</td>
<td>6.1</td>
<td>22.5</td>
</tr>
<tr>
<td>2009</td>
<td>8.0</td>
<td>28.9</td>
</tr>
<tr>
<td>2010</td>
<td>9.8</td>
<td>34.4</td>
</tr>
<tr>
<td>2011</td>
<td>11.6</td>
<td>41.6</td>
</tr>
<tr>
<td>2012</td>
<td>13.4</td>
<td>46.6</td>
</tr>
<tr>
<td>2013</td>
<td>14.8</td>
<td>50.0</td>
</tr>
</tbody>
</table>

There are 33 commercial banks listed in Malaysia. CIMB has been declared as the best online banking in Malaysia, as it provides high quality online services (Krishanan et al., 2015).

According to Al-Fahim et al. (2012) a survey of Malaysian International Islamic University (IIUM) student’s online banking adoption in Malaysia reported that most respondents occasionally use online banking, and many of these respondents had little knowledge of online banking services. Findings also revealed that perceived usefulness and perceived ease of use was found to be important and
also that relevant factors in online banking were used by IIUM students. However, despite the steady growth of online banking users, there are still some obstacles to the acceptance of these services in Malaysia (Poon, 2007). Furthermore, a study carried out by Tat et al. (2008) investigated the determinants of intention to use online banking at least once in the user's experience in the Klang Valley. Multiple linear regression results showed that three important predictors, including trust, compatibility, and ease of use, were perceived as 56.0% variance using online banking intentions. Among the many factors, trust was seen as an important challenge for the continued existence of online banking. Yousafzai et al. (2009) also argued that lack of customer trust is potentially a major barrier to widespread adoption of online banking. As customers establish business relationships with remote and inhumane banking services, they may experience greater perceived risk and uncertainties in the online banking environment. It is recommended that customer distrust in online banking be overcome by establishing, validating and maintaining trust.

2.1.3.2 Online Banking in Singapore

Singapore's online banking began in 1997, when five local banks in Singapore set up their own corporate website (Tan & Teo 2000) on the internet. They are the Singapore Development Bank (DBS), OCBC, OCBC, POSB and UOB. However, in the provision of online banking services, these banks took a slightly conservative position. Local banks agreed that online banking services could take over routine banking transactions. However, customer contact in value-added services such as investment advice remained important (Tan & Teo, 2000). None of the banks will take the lead in providing online banking services, as they thought this could lead to changes on a competitive basis. In addition, customers do not really provide them with online banking services.

Interestingly, by January 1998, a more positive approach was taken instead of the conservative approach to providing online banking services. For example, the United Overseas Bank and DBS already started offering online banking services. Overseas Chinese Banking Corporation (OCBC) were testing its online banking services at the time, while the Overseas Union Bank (OUB), the foreign affiliate,
announced plans to launch e-banking services in late 1998. Banks began to view online banking services as a strategic initiative to provide their customers with an overall distribution network. In addition, by providing online banking services, they were able to position themselves as market movers (Tan & Teo, 2000).

### 2.1.3.3 Online Banking in China

China is one of the developing countries in Asia. Chinese Merchants Bank (CMB) was the first to launch the internet payment system in 1997. Although internet usage was relatively low at the time, online banking was still at its early stages (Laforet & Li, 2005), but the advantages of online banking are convenient, safe, efficient and economically very promising. Chinese banks believed that the benefits of online banking outweighs traditional banking services in the future and were therefore eager to implement new technologies and services to capture, penetrate and gain a competitive edge at the time (Laforet & Li, 2005). Most retail banks in China now offer online banking as an add-on to existing branch activities while mobile banking is in the initial stages of implementation. There is a record of rapidly increasing spread of online banking systems in China (Laforet & Li, 2005).

### 2.1.3.4 Online Banking in Arab Nations

Arab countries are still in the early stages of developing online banking (Khalfan et al., 2004). Lack of national financial development policies has a direct impact on private investment and enterprise development, especially on online banking infrastructure (Touati, 2008). The Arab retail banking market is heavily dependent on entities ranging from large multinational banking groups to regional banks and from generalist to more specialized Islamic banking sectors. Transactional online banking is generally still low in terms of general preparation. For example, in 2000 only 18% of banks provided online trading facilities (Touati, 2008). These are mostly foreign banks with regional presence. Thirty-nine percent of banks in the region do not even have information sites (Touati, 2008). With the absence of digital certification laws, there is no credible local third-party security facilitator to prevent security threats within the Arabian banking systems.
However, the decentralization of research not only in advanced countries, but also in developing countries from Asia, forbids scholars from facing more integrated challenges in the banking sector when conducting bank transactions in cyberspace. Table 2.2 provides a summary of the online banking presence in six different countries discussed in this study, including Malaysia.

<table>
<thead>
<tr>
<th>Online Banking in Developed Countries</th>
<th>Focused of this Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online Banking in USA</td>
<td>×</td>
</tr>
<tr>
<td>Online Banking in UK</td>
<td>×</td>
</tr>
<tr>
<td>Online Banking in Malaysia</td>
<td>✓</td>
</tr>
<tr>
<td>Online Banking in Singapore</td>
<td>×</td>
</tr>
<tr>
<td>Online Banking in China</td>
<td>×</td>
</tr>
<tr>
<td>Online Banking in Arab Nations</td>
<td>×</td>
</tr>
</tbody>
</table>

### 2.2 Advantages and Disadvantages of Online Banking

There are numerous advantages and disadvantages of online banking to both, customers and banks. The innovation and efficiency of services online banking brings also has two sides- while there are advantages and benefits associated with utilizing online banking services, there are also limitations or disadvantages in form of security threats and other associated risk. This section discusses the associated advantages and disadvantages of online banking to both banks and customers.

#### 2.2.1 Advantages to the Customers

For customers, online banking has many advantages, such as ease of use, price convenience, and savings in time compared to visiting bank branches (Jayawardhena & Foley, 2000). There seems to be a general agreement that online banking offers customers useful benefits and flexibility. The portability of online banking facilitates ease of use and convenience in carrying out financial transactions. For example, if customers are facing financial problems abroad and cannot access their funds through other means, they can access their account through online banking services wherever they are, as long as these customers have internet access. This is one of the
main benefits or advantage of online banking services for customers (Tan & Teo, 2000). The potential competitive advantage of online banking is to reduce costs and meet customer needs (Bradley & Stewart, 2002) more flexibly.

Other online banking advantages include (Cronin, 1999)
- Time saving and no more visiting bank branch regularly.
- Access to the bank at anytime and anywhere whether in the day or at night, weekends and even holidays makes it more convenient than traditional banking.
- Viewing past bills without having to keep old documents on account statements, which eliminates a lot of paper work and creates more space, previously obtained through statement files
- Better monitoring of cash flow because you can view your account at any time and view all transactions that occurred within a specific timeframe
- Customers can schedule automatic or pending transfers of bill payments. This eliminates the problem of paying bills at the end of the month.

2.2.2 Advantages to the Banks

Tan & Teo (2000) found that most of the banks with Web sites spent less than $25,000 to create websites that cost less than $25,000 per year. They suggest that even as these numbers rise as more and more banks begin to offer online banking services, they are still less costly than traditional banking services. While the operating costs of traditional banks are between 50% and 60% of revenues, the operating costs of online banking are estimated to be between 15% and 20% (Tan & Teo, 2000). It also helps banks to provide potentially lower costs than traditional banking services.

2.2.3 Disadvantages to the Customers

The shortcoming of online banking technology also involves customers and banks. Despite the many advantages of online banking, there is no doubt that the shortcomings may affect customer acceptance and trust in online banking to some extent (Tan & Teo, 2000). For example, increased interpersonal distance between
banks and customers can lead to reduced trust and increased security issues. In addition, the lack of knowledge on the use of online banking services by customers is particularly important for understanding the slow rate of online banking acceptance (Tan & Teo, 2000).

Other online banking disadvantages to the customers include (Cronin, 1998).

- Internet connection required. As a result, customers who are not connected will not be able to use the services provided by internet Banking.
- Transfer or payment is inefficient. It may take up to four business days for the transfer to clear the recipient's account. As a result, traditional banks are much faster than online banks.
- Swap banking is more complex than online trading. This means that closing an account online is much more difficult than doing it through traditional means.
- Only those who have good knowledge of computers and internet skills can effectively utilize online banking services.
- Some banking services must be done face-to-face. Bank drafts, cash orders and telegraphic transfers. At present, these services through internet banking are limited.

2.2.4 Disadvantages to the Bank

The main disadvantage of online banking to banks is the increased risk of loss of money and its reputation on the banking institution. Other shortcomings of online banking to banks are the reduction in the number of banking jobs. This will result when online banking is more actively utilized for financial transactions as banks would no longer require the services of more banking staffs due to the reduction in workload of banking staffs (Tan & Teo 2000).

Other online banking disadvantages towards banks include (Sohail & Shaikh, 2007):

- Cybercrime and money laundering: in this case, the bank is difficult to identify customers. As a result, it increases the crime rate
Online banking depends on IT, the fault tolerance and robustness of information technology can adversely affect the services provided by online banking

2.3 Theories Used in Online Banking Adoption


A study conducted by Nor et al.(2008), applied the theory of Diffusion of Innovation Theory (IDT) (Rogers, 1995) that focused on five key beliefs (relative advantage, compatibility, complexity, trial ability and observability), could be considered as one of the earliest theories that attempted to explore factors that influence an individual’s ability to adopt an innovation or a new technology.

Technology Acceptance Model (TAM) has been adapted from the TRA (Ajzen & Fishbein, 1991 and Fishbein & Ajzen, 1975). Technology Acceptance Model (TAM) was introduced by Davis, (1986) to explain information technology acceptance. TAM is the most widely applied theory in understanding individual’s beliefs towards acceptance and use of technology because it specifically focuses on information system use. TAM posits that technology usage is directly determined by behavioural intention of an individual, which is, in turn, influenced by user’s attitude towards technology, Perceived Usefulness (PU) and Perceived Ease of Use. Perceived Usefulness (PU) refers to the degree to which users perceive that use of technology will improve his/her performance (Davis, 1989). Perceived Ease of Use
(PEOU) refers to the degree to which the users perceive that using the technology will be free of effort (Davis, 1989).

Decomposed Theory of Planned Behaviour (DTPB), suggested that a better understanding of the relationship between the belief structure and the intended premises requires the decomposition of attitudinal beliefs (Taylor & Todd 1995). Rogers, (1983) it is also pointed out that, based on the diffusion of innovation theory, attitudinal beliefs have three distinctive characteristics that affect the innovation adopted, and they are relative advantages, complexity and compatibility.

Unified Theory of Acceptance and Use of Technology (UTAUT) was designed to unify the multiple existing theories about how users accept technology (Venkatesh & Morris, 2000 and Venkatesh et al., 2003). UTAUT was created from the following eight notable theories: Theory of Reasoned Action (TRA) from Davis, Bagozzi & Warshaw (1989); Technology Acceptance Model (TAM) from Davis, 1989; Venkatesh & Davis, (2000); Motivation Model (MM) from Davis, Bagozzi, and Warshaw (1992); Theory of Planned Behavior (TPB) from Taylor & Todd (1995); Combined TAM and TPB (C-TAM-TPB) from Taylor and Todd (1995); Model of PC Utilization (MPCU) from Thompson; Innovation Diffusion Theory (IDT) from Lee et al. (1991) and Social Cognitive Theory (SCT) from (Stajkovic et al., 1999). Based on the combination of eight theories, UTAUT explains the behavioral intention to use or adopt technology by proposing four predictive determinants (Venkatesh et al., 2003), performance expectancy, effort expectancy, social influence and facilitating conditions.

Perceived Risk Theory (PRT) has been used to explain customer’s behavior. Considerable research has examined the impact of risk on online banking consumer decision making (Lin, 2008). Peter & Ryan (1976) defined perceived risk as a kind of subjective expected loss. Most scholars claimed that a customer Perceived risk is a kind of a multi-dimensional construct. Six components or types of perceived risk have been identified, financial, performance, social, physical, security, privacy, and time-loss (Jacoby & Kaplan, 1972 and Kettle et al., 2016).


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